HESI pilot project: Testing a qualitative approach for incorporating exposure into alternatives assessment

Greggs, Bill; Arnold, Scott; Burns, Thomas J. ; Egeghy, Peter; Fantke, Peter; Gaborek, Bonnie; Heine, Lauren; Jolliet, Olivier; Muir, Derek; Rinkevich, Joseph

Total number of authors:
12

Publication date:
2016

SUBMISSION ROLE: 20th Annual Green Chemistry & Engineering Conference
CONTROL ID: 2488333
ABSTRACT SYMPOSIUM NAME: Alternatives Assessment and De Novo Design-Oral
AUTHORS (FIRST NAME, LAST NAME): Bill Greggs[2], Scott Arnold[5], Thomas J. Burns[6], Peter Egeghy[7], Peter Fantke[8], Bonnie Gaborek[9], Lauren Heine[3], Olivier Jolliet[10], Derek Muir[11], Joseph Rinkevich[4], Neha Sunger[12], Jennifer Young Tanir[1]
INSTITUTIONS (ALL):
1. Health and Environmental Sciences Institute, Washington, DC, United States.
2. Soleil Consulting, LLC, Sanibel, FL, United States.
3. Northwest Green Chemistry, Juneau, AK, United States.
4. Scivera LLC, Charlottesville, VA, United States.
5. The Dow Chemical Company, Midland, MI, United States.
6. Novozymes, Raleigh, NC, United States.
7. U.S. Environmental Protection Agency, Raleigh, NC, United States.
8. Technical University of Denmark, Kgs. Lyngby, Denmark.
9. DuPont, Newark, DE, United States.
10. University of Michigan, Ann Arbor, MI, United States.
11. Environment Canada, Burlington, ON, Canada.
12. West Chester University, West Chester, PA, United States.
TITLE: HESI pilot project: Testing a qualitative approach for incorporating exposure into alternatives assessment
ABSTRACT BODY:
Abstract: Most alternatives assessments (AA) published to date are largely hazard-based rankings, and as such may not serve to determine a practical and functional replacement. With an assessment goal of identifying an alternative chemical that is more sustainable, other attributes beyond hazard are also important, including exposure, risk, life-cycle thinking, performance, cost, and social responsibility. Building on the 2014 recommendations by the US National Academy of Sciences to improve AA decisions by including comparative exposure assessment, the HESI Sustainable Chemical Alternatives Technical Committee, which consists of scientists from academia, industry, government, and NGOs, has developed a qualitative comparative exposure approach. Conducting such a comparison can screen for alternatives that are expected to have a higher exposure potential, which could trigger a higher-tiered, more-quantitative exposure assessment on the alternatives being considered.

This talk will demonstrate an approach for including chemical and product exposure information in a qualitative AA comparison. Starting from existing hazard AAs, a series of four exposure examples were examined to test the concept, to understand the effort required, and to determine the value of exposure data in AA decision-making. The group has developed ingredient and product parameter categorization to support comparisons between chemicals and methodology to address data quality. The ingredient parameters include a range of physicochemical properties that can impact exposure, while the product parameters include aspects such as exposure pathway, use pattern, frequency/duration of use, concentration in product and use volume, accessibility, and disposal. Key learnings, challenges, and opportunities for further work will also be presented.
(No Image Selected)
(no table selected)